ARGONAUTS

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Programmers Registry

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New low price. See page 3 for details and reward for charter subscribers.

$24.95

The Next Step

Sarah C. Bell, Marketing Director, The Stepstone Corp

The Objective-C language, a superset of ANSI C, is the richest implementation of object-oriented technology available to the C programmer, combining the efficiency and familiarity of C with the object-oriented messaging facilities of Smalltalk.

Objective-C was developed by the co-founders of Stepstone in 1983. The current language definition (v4.0) was released in 1988. In 1990, v4.3 was released, representing two years of bug fixes and enhancements to the static binding facilities which were introduced in v4.0 of the language. The result is a solid and stable product that, in three years, has not required a maintenance release for bug fixes. The Objective-C language will continue to be enhanced by Stepstone. In 1988, the Stepstone Corporation sold the source code to the Objective-C Compiler to NeXT, Inc. Objective-C is now the foundation of the NeXTSTEP programming environment.

Objective-C was created to boost programmer productivity by lending itself to the creation of reusable software components. The software equivalent of IC's (integrated circuits). The essential language features of encapsulation, polymorphism, and dynamic binding provide the capability to build truly reusable software components. The goal of Stepstone is to make system building a modular task. This will enable the programmer to concentrate on the logic and design of the application, and let the software take care of the mechanics.

Encapsulation is fundamental to the value of object-oriented technology. The ability to declare data and operations in one module and then restrict access to the data from outside the module allows programmers to divide a problem into manageable pieces. This capability can then be brought to a higher level. Elements of a system, such as a network, can be hidden behind an interface that is generic to all such elements, or networks, rather than expecting programmers to learn the details of several different networks. Elements of the system are encapsulated and the result is transparency. The development of such APIs make open systems possible. Nynex is an example of a telecommunications company that used Objective-C to develop a large network element manager called "Allink". Ford Aerospace has licensed Allink for use by the U.S. Federal government's communications group.

Polymorphism and dynamic binding together are critical to the success of object-oriented programming. Objective-C's polymorphic design delivers the true power of object-oriented design and implementation. The internal structure of an object should not need to be known, simply the method names that it recognizes, regardless of the internal implementation, i.e., where in the inheritance structure the object resides. Objective-C's true polymorphism is made possible by the

existence of true dynamic binding. This design delivers maximum flexibility and reusability of code.

This is a fundamental difference between Objective-C and C++. C++ was intended to fix what was inefficient in the C language at the machine level. C++'s approach is not to have a central routine, essential to software reuse, but to go directly from the calling site to the target site. It lacks true polymorphism, hence, the programmer is still bogged down with implementation details. Multiple inheritance was introduced to address the lack of true polymorphism. Multiple inheritance creates even more dependencies within the code.

The dynamic messaging model supported by Objective-C makes truly reusable class libraries possible. For example, Container classes may contain objects of any class, not just ones that share a common superclass. Even more important, they will be able to contain objects from classes that haven't even been written yet. Classes defined by separate development groups can be used in an application without having to modify the modules once they are delivered. This is a direct result of deferring binding past compile time. Some supposed object-oriented languages don't have dynamic binding at all and some, such as C++, allow it, but not as the default.

Those using Smalltalk have realized the power of dynamic binding. Given that a program can spend up to fifteen percent of the CPU time in the messenger, Smalltalk is sometimes considered to be too slow for the development of real-time systems. Objective-C offers all the flexibility of Smalltalk but also offers the capability to statically bind your code at any point during the application. You have the option to use dynamic binding for prototyping when flexibility is important, and you can switch to static binding for delivery of your system, when performance is crucial.

The goal of this article is to provide some background on the origins and the technical attributes of Objective-C. Stepstone supports the Objective-C language on SUN,HP,DEC,IBM PCs and workstations, Data General, Silicon Graphics, MIPs, and the MAC. We do not currently have the resources to support the Amiga system, but ask Amiga developers who would like to develop with Objective-C to make their wishes known to Commodore. Thank you.

Sarah may be contacted at: 1-800-BUY-OBJE(CT) ❏

» Stepstone update «

In a follow up conversation with Sarah Bell we talked about the status of Objective-C vis a vis the Amiga market. Objective-C is usually sold as a preprocessor along with some code to handle the message passing and class libraries to make the thing useful. Theoretically it can be ported to any platform with C compilers available.

At this point there have been discussions between Stepstone and Commodore about getting Objective-C ported to the Amiga. This has cleared lower levels of management and is now in the hands of the Big Bosses so to speak, at Commodore. The reason for all this negotiating of course, is that money is involved. Under the current negotiating

Editorial

With this issue, Argonauts is beginning to come into focus. I've received a lot of feedback on the concept of something like this in the Amiga market, and I'm glad to say it was positive. The one thing people wanted changed was the price. Enough people raised this issue that I'm convinced the market is bigger for something like this than I originally thought. As a result, the subscription price is being reduced to $24.95 per year. To reward charter subscribers, their subscription is doubled to two years or they may instead write and ask for a $25 refund and keep a one year subscription. As an added bonus, all paid subscriptions will start from this issue forward.

This is a time of great ferment in the Amiga heavens. There is a lot to look forward to over the next several years. The Amiga is beginning to attract attention from large organizations interested in using the new systems as embedded controllers or as inexpensive delivery platforms. How many people know for instance, that the largest installed base of networked Amiga's in the world (should be 15,000 by year's end) is in Australia? The Amigas are embedded controllers in casino gaming machines that sell for approx $100,000!

At the recent DevCon in Orlando you could see name badges from places like McDonald Douglas, NASA and other large companies. One engineer was there evaluating the systems for use in a medical imaging system. Others were there kicking the tires on the technology to see just what it was really capable of.

At the local dealer/VAR level, tools needed to develop custom kiosk solutions are maturing very rapidly. This opens up many opportunities for the small consultants and dealers. Forthcoming real-time video encoding technology(based on MPEG hardware chips due in 1994 from various manufacturers) will make non-linear digital video editing cheap. This technology will of course be available for the PC and Mac but the Amiga software base gives it an advantage. While it will still be too expensive for home use, it opens up interesting possibilities as a service bureau business for even the smallest dealer.

Of more immediate interest though, is the business infrastructure in the Amiga market. Some of my comments in the last issue hit

environment Commodore would be paying Stepstone to produce the port. The other possibility is that SAS or Manx/Aztec would do it themselves under some kind of royalty agreement with Stepstone. Details can be obtained by contacting Sarah.

Where does this leave the reader? If you're content to try and earn a living programming with stone knives and chisels (read C) then you don't have to do anything. If you're a publisher who is happy to see projects stretch-out toward the event horizon of the nearest black hole you don't have to do anything. If on the other hand you are tired of being in those situations, fire up the wordprocessor and write to CATS and your C compiler company and ask for Objective-C. Include your developer number and let them know how having O-C would impact your product plans.

Do not send e-mail, it does not carry anywhere near as much weight as a written letter. After all, if it isn't important enough to you to make that much effort, why should anyone else think that if it were available you would actually buy it?

The Publisher

DevCon T93 - Point of Contact

Dan Weiss Soft-Logik

This past January several hundred developers met in Orlando, Florida at the 1993 Amiga Developers Conference. I can assure you that you missed a significant event. No, not the NewTek party, but the DevCon as a whole. The halls and sessions were packed with everything and everyone you needed to know to be an informed developer. While I would like to tell you all that went on, my non-disclosure agreement and space limit me. The following were the high points.

Hard facts first, some things I can talk about. The graphics technology in the AGA machines (AA to us) is the base of the future. The A1200 and A4000 will quickly become the baseline in imaging technology as other machines are phased out.

The A4000, as you know, relies on a daughter board to hold the microprocessor. This means that upgrades are physically easy to handle. To support this, Commodore will be coming out with a 68040 board with a DSP (digital signal processor) and a separate 68030 board. With these boards the A4000 can be sold in both a higher and lower end model while the main chassis remains the same. This cuts the costs of the units and improves Commodores ability to compete price wise.

As an extension to the AGA technology, there will be an AA Graphics Enhancer. The enhancer combines a frame buffer with a scan converter and allows all the AGA modes on a wider range of monitors. This is good news for all those A4000 owners that are hard pressed to find affordable monitors that really work with their computer.

On the softer side there was a lot of feelings and directions stuff covered. The first feeling I got was the size of Commodore and what it

raw nerves with many people, especially the lack of decent data on various markets. Whether you are funded by venture capitalists, banks or worse your own money, you need data to know where to put it. Should you keep investing in this market or is it time to get out of computers altogether and open a McDonald's franchise? Knowing the top 10, 20 or 50 selling programs doesn't tell you that. Knowing that the top selling program sold 30,000 copies last year and 50,000 this year does.

The much maligned dealers, who are often treated as the lowest form of life in the food chain, feel this lack the most. They are also the ones who have expressed the most willingness to supply the data. Starting with this issue the back page will have a survey for dealers to fill out and mail back. The consolidated results will be published in the following issue for all to use and see.

There was also a lot of interest in a "registry" for commercially active Amiga people. It turns out that registered developers make up only a fraction of the total number. It might also come as a surprise that not everyone has an internet or BIX account. Starting with this issue we will publish a registry form for those wishing to be listed. It is open to any subscriber. Currently the first registry is scheduled to be published in October. A minimum of 1,000 extra copies of that issue will be forwarded to CATS free of charge to be given out to companies looking for people with Amiga talents. Talents means artists as well as programmers, so take a look at the form and see if you fit.

I had hoped to start full international coverage with this issue but some unnamed people in France and Germany failed to come through while bad timing messed things up with Australia. On the bright side we should have news from Russia next issue on satellite image data and analyses. No, not spy sats. This will be about landsat type data. When you think about all of the educational possibilities to say nothing of land use and ecological applications this could be the next deep pocket market for the Amiga. It is something I am very excited about and hope to be able to follow up with articles from SPOT and Landsat, the other two sources for this kind of data.

There is much more going on but that is all I can talk about this time. I would like to close with an admonition for the programmers. It's giving nothing away to say that the bar is

has accomplished. Despite the image we have of a huge company, the reality is that they are very small. You could take all of the people from CATS, Software and Engineering and fit them in a surprisingly small room. Add this to the fact that they have managed to put out an amazing true multi-tasking operating system and innovative hardware, you can see how hard they work. If you then think of all the things that are in the works, things that have already come out as side projects and the projects that never see the light of day, you have to stand in awe. Meeting the faces behind the names buried in include files and *Amiga Mail* articles can be a truly enlightening experience.

Illuminating was John Campbell's statement that there is indeed an A list in CATS. As many of you may know, CATS is over worked like the rest of the Amiga people. How then does Commodore choose who gets the most attention when there is only so much to go around? Well John Campbell, head of CATS, laid it out. The first cut is made by what level of developer you are. If you are a Commercial developer you come before the Certified developers. This cut is based plain and simple on the fact that the commercial developers are the people that are doing this full time and are selling the software that sells the machines. But within the A list there is another A list. These are the people that support CATS in their effort to support the developers. They send in copies of their products as they become available. CATS maintains a library of software so that they can test products for compatibility. This is not some cheap trick to get a free copy of your wizzo software, but rather a serious effort to test their products with your products so that they work best together.

Say no more

At this point I have to stop and check myself. Have I told too much, do you already know what I'm telling you, because is it public knowledge? You see, here is one of the biggest problems with not attending the developer conferences. There is a lot of information that gets exchanged under the cover of the non-disclosure agreement. People at Commodore are more willing to tell you the things you need to know when they can look you in the eye and swear you to secrecy. Most importantly you know it ahead of time. That means that if there is an important new feature in the operating system or hardware that you feel you can take advantage of you can get a head start on it.

Another key factor is getting to know who you should know. As with CATS, a lot of Commodore works on who you know. It's not a matter of any secret handshake, but simply a matter of walking up to the person and introducing yourself, and telling them what you are working on. If you get to know one person, they can often introduce you to several other people that can give you the help and information you need. In my personal case everyone I met was more than happy to introduce me around. One person in CATS, who has my undying gratitude, was always happy to track down the person I wanted to meet and introduce me. And for that alone, the DevCon was well worth it.

being raised significantly by next generation Amigas. The kind of skills needed to write code for medical or satellite imaging is far removed from what it takes to recompile someone else's Mac or PC or UNIX code onto the Amiga. Neither will clever hacks count for much.

If the Amiga is where you want to earn a good living I think that is very possible. Think for a moment about where you want to be 5 years from now? Now ask yourself if you're going in a direction that will get you there? If the answer is no then do something about it! As an outsider coming into the Amiga market one thing I've noticed is that there are too many people, especially in America, who seem content to explore what others have created rather than go off and create something unique themselves.

After attending DevCon I think that some of the best talent in the industry is in the Amiga market. The bottom line though is that a handful of superstars don't write most programs or create most of the hardware, that's done by the unwashed masses so to speak, or the rest of us as Steve Jobs once put it. That means that even small improvements in the quality of the average developer can have a large impact on the market. Something to think about.❑

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Due to the volume of mail I cannot guarantee that you will get an individual answer. I can tell you that subscribers get answered first and everyone else later. Finally do not use e-mail for subscription questions, those are handled by a different person at a different location via the PO Box.

No Respect

Seen in a computer virus brochure from TigerDirect 800 666-2562

"Frankie - is a malignant virus that attacks Atari and Amiga computers running Macintosh emulators. You can run infected files on a regular Macintosh computer without risk of spreading the virus"

Next time, be there

At the next DevCon, you will find me along with those I work with. You will also find the people from Commodore, developers from around the world, and more exciting Amiga information. So take my advice, Next time, be there.❑

» *Publisher's Note* «

The Commodore non-disclosure agreements permit discussion of items covered by the agreement once those things become publicly known. The hardware Dan mentions in the article has been shown or discussed since DevCon at various trade shows.

The DevCon conference notes were excellent. If you did not attend DevCon itself, the proceedings are a must have. Contact CATS at 215 431-9180 for ordering details.

Pie on the Menu in Your Program

© 1992 by Carl C. Rollo

Those of you who have been following the development of windows-based Graphical User Interfaces (GUIs) in the literature lately may be aware that there is a new kid on the block in menu design. The IBM PC-compatible world is buzzing a bit with the term, "Pie Menus". At least one start-up company with a pen-based user interface has adopted this type of menu as the principle access for stylus users to its operating system. Since the world of Amiga has long been one of a windows-based operating system, and, since Pie Menus are an idea firmly in the public domain, maybe its time you got introduced to the new kid.

Pie Menus are simply a style of menu format that looks roughly like a pie chart in business graphics. You know; that chart the Government uses every year to tell you where they spent your tax dollars. (and spent, and spent...) The concept is quite simple. The selection area for a pie menu is a wedge of the pie. You point, move the mouse, or use the keys to get the cursor into the wedge with the selection you want, and then lift a stylus, click the mouse button, or hit the Enter key to make your selection.

Where did this simple, but powerful idea come from? Well, Pie Menus belong to a class of menus known as "circular menus". The earliest reference that I can find to circular menus dates to 1969 [8], and they were described in one of the best known texts on computer graphics [6] by 1973. A circular menu is simply a menu whose option targets are arranged in a circular arc around the cursor's starting position. The jump from circular menus to Pie Menus came with the work of Don Hopkins [2] at the Human Computer Interaction Laboratory of the University of Maryland in the years, 1986-1988. Don's contribution was to change the circular arc of small targets to a pie-shaped design with the selection area becoming an entire wedge of the pie radiating out from the center to the circumference of the circle.

So why change from the stack of little rectangles that we refer to as

Sex and the CD

While all the tech weenies have been arguing about which CD-ROM player was going to wipe out all comers, a funny thing happened. Reality intruded.

All the market analysis I've seen comes from computer types. They have focused almost exclusively on the gee wiz aspects of the various players to the exclusion of one very important use. Straight forward playback of rented pre-recorded movies. These movies will be stamped in a generic MPEG format that any of the CD-ROM gadgets will eventually be able to play.

All of a sudden the format war is over before it starts. The most important question a consumer will ask is, "Does it play the disks my video store rents?" The second question will probably be, "Will it play those Kodak discs?"

How will consumer electronics companies sell these into the home? How would you like to replace the VCR, Sega/Nintendo and home computer? All for one low price and one stereo size piece of equipment. Anything the box does above and beyond playing back movies and the family album will be a plus.

Does this sound like anything we know? An AGA based CDTV at $499, with an MPEG decoder would be a very attractive system. Still not convinced. CD-ROM based software will essentially kill off software piracy in the mass market. All software developers who don't want to see this happen please step forward.

You still don't think it will happen this way? How many video rental outlets are there in the U.S.? What do you think their reaction is to a medium that is much more rugged than the video tapes they need to constantly replace because of wear and tear? Why do you think Philips recently took a large equity stake in Block Buster Video?

What do you think the reaction of the movie studios is to a medium that can't be copied easily and represents a new market for selling their product. Remember that the studios have enormous film libraries that can now be resold using this new medium.

Incidently, I think that the Federal law which prohibits the rental of computer software is going to come back and haunt us once CD-ROM players become popular. The movie studios have generated a very nice income from selling tapes to stores that in turn rent them. Under current law the software indus-

standard menus (also known as linear menus) to Pie Menus? Several improvements occur:

- The wedge of a pie chart widens as you move from its center, meaning that the area of selection rapidly increases with movement from the starting position. This helps to insure that a correct selection is made.

- All selection targets are at a uniform distance from the starting position. This means that the mean seek time is fairly constant regardless of target location.

- The distance required to move the cursor is quite small, merely far enough into the pie wedge for the system to recognize which target is currently under the cursor.

- A good Pie Menu system will automatically position the cursor at the center of the pie. This location has real meaning when you also consider the uniform distance benefit. After all, in a linear menu, you can certainly position the cursor automatically, but where? Even if the cursor is positioned at the middle of the linear menu, the distance to targets not in equivalent positions varies, which raises the possibility of missing the target and selecting the wrong option. And if you have never selected the wrong option while using a program with standard menus, you don't use your computer much, do you?

- And finally, the best for last. Don Hopkins has placed his work in the public domain, so this is one GUI that is free to be implemented on any system in any way a program may wish. [3]

All of these improvements result in a speed increase of 15% to 20% in selecting from a Pie Menu versus using a linear menu [1].

In the real world, nothing is without a price, right? So what is the price we have to pay for Pie Menus? Well, one obvious disadvantage is that Pie Menus take up somewhat more screen real estate than linear menus. We can use some tricks to partially overcome this problem. In experimental code that I developed for the Microsoft Windows operating system to display Pie Menus [7], I provided for labels either inside or outside the pie. Since Windows allows only horizontal text (without special provisions), you can display a Pie Menu that is fairly small in the vertical (Y) axis by sizing the pie, itself, to display a small circle and surrounding the circle with labels that are long in the horizontal (X) direction. This can be a help where long option names are a problem, but the circle can't be too small or you lose the advantage of selection accuracy due to larger selection area.

Another way to overcome the size problem is to use icons as labels for the Pie Wedges instead of text, but icons also have their problems including that of just plain being difficult to recognize. If the iconic labels on the instrument panel of the international cars we drive these days haven't left you with at least one icon's worth of puzzlement, you have been lucky!

The size problem brings with it another problem. That of limiting the

try has locked itself out of this market. This is the kind of thing that the legal crowd should start looking into now so that the law can be amended to allow rental of CD-ROM based computer software.

Is there anything special I'd like to see go into this next generation CDTV that I think would make a big difference to software developers? Glad you asked. A few things come to mind. The first is the famous DSP chip. If it were technically possible to use this to do the MPEG decoding we get both MPEG and all the other things you can use that AT&T chip for. Having it there would open up a lot of possibilities for third party developers. If cost prevents it from being standard equipment then it should definitely be available as an add-on module.

A choice of case colors. Most stereo equipment let you choose between black and brushed aluminum, sometimes even wood veneer. I think this would be a good tactic. I think the toy appeal of having blinking LEDs that reflect the state of memory and address lines would also be attractive. This would have no useful purpose. It would be there to catch the eye. These things sound silly but this is the kind of detail that makes or breaks consumer products.

Another thing I would like to see built in is support for an AC outlet based network. Sears has sold such a gadget for years and industry has recently approved a generic network technology based on AC wiring to control appliances. Why do I want to see this standard on CDTV? Controlling house hold appliances is ok but there is a more interesting possibility. If you have an AC outlet based network it will operate across different houses. Any house or apartment on the same side as the nearest step down transformer can communicate. All of a sudden you can have multiplayer games with your neighbors. If you're a school you have just networked your CDTVs without having to buy or install any special wiring! If you are in the kiosk or presentation business you can use this to easily implement simple messaging systems for people using the kiosks. This comes in handy at special events, fairs etc where people could leave messages for each other and then retrieve them from the nearest kiosk. It also makes possible an el cheapo voting booth for all those organizations that need to elect various officers. It does all of this cheap.

number of options that can be placed on each Pie Menu. Generally, it is best to limit the number of options to eight or fewer. An even number of options is also best, and there is a special case of performance improvement for twelve items. The reason for this is the intuitive analogy formed in the human mind with a clock face. There isn't space to go into the research that produced these results, but see [4] for more details.

The restriction on number of options (eight or less) may not be as much of a problem as it seems. In [5] a study was made comparing circular menus to linear menus. Besides discovering that, "...for small number of items the circular menu has a distinct advantage.", this study also found that linear menus with a larger number of items (even where scrolling was provided) caused users to be slower in making the selection and were uniformly disliked by same.

Finally, there is an aspect of Pie Menus which is drawing considerable interest both from researchers in human-computer interaction and from industry as the technology of stylus-controlled notebook computers becomes a reality. Pie Menus, because of the uniform distance to each target and because of the relatively larger selection area in a target, are much easier to control using a stylus or "pen". Further, the selection of a given sequence of options from a hierarchy of Pie Menus translates into a particular track of hand motions. This track can quickly be learned by a novice users and "smooths the transition from novice to experienced user".

The learning pattern is so strong that studies [4] have been done where the Pie Menu is only displayed if the user pauses for longer than a second. Then the menu is displayed, or becomes "self-revealing", in the researchers terminology. The speed of this technique may become apparent to you if you say to yourself, "right a short stroke and down saves the current file and exits my word processor". This is very much like shorthand for an operating system. Even in trying to visualize it, you can feel the speed! ❏

Further reading:

[1] Callahan, J., Hopkins, D., Wiser, M., and Shneiderman, B., "An Empirical Comparison of Pie and Linear Menus", Human Factors in Computing Systems, Conference Proceedings of SIGCHI, ACM, 1988

[2] Hopkins, D., Callahan, J., and Weiser, M. "Pies: Implementation, Evaluation, and Application of Circular Menus", Univ. of Maryland Computer Science Department Technical Report, 1988

[3] Hopkins, D., "The Design and Implementation of Pie Menus", Dr. Dobbs Journal, December, 1991

[4] Kurtenbach, G. and Buxton, W., "Issues in Combining Marking and Direct Manipulation Techniques", UIST'91, ACM Press, pp. 137-144

[5] Mills, Z. and Prime, M., "Are All Menus the Same? - An Empirical Study", Human-Computer Interface - INTERACT '90, Elsevier Science Publishers B. V. (c) IFIP, 1990

[6] Newman, W. M. and Sproull, R. F., Principles of Interactive

This is a feature that doesn't seem important until you put it in and watch how people start to use it. Personally I think this has so much PR value as well as utility that it should be in the next CDTV on the motherboard. An add-on Zorro card so that a regular Amiga could be used to control these features is also a priority.

All of this is well and fine for Commodore who gets rich selling movie players but where does that leave the developers.

Based on the paucity of females at the Dev-Con I think its time for Amiga developers to discover the opposite sex. Girls and women make up slightly more than half the population, yet there is very little in the way of software that caters explicitly to them. A consumer based product like CDTV will need gender biased software to succeed. We already have plenty of male biased software so its time to concentrate on the females.

If you're going to do this, do it right and pick something that will stir a lot of media attention. A good first choice is sex education. Not XXX pornography but the kind that answers typical children's questions. Obviously you could produce different versions tailored by age group. Anyone who thinks this can't be done tastefully and in a non offensive manner should go out and rent the movie "Look who's Talking."

Using genetic algorithms it would be easy to include games that illustrate the purpose of sexual as opposed to asexual reproduction. Given the problems in America discussing this topic it is an ideal choice for a visual self paced application. Done with class and taste, this application alone could sell a LOT of players.

At an adult level you could look into a collaboration with the Feminist Health Press on doing a CDTV version of "A New View of a Woman's Body." Since I can practically see the male readers squirming I'll keep the description short. The book is designed to empower women about their own bodies. It wouldn't hurt the average man to read this book either.

These kinds of titles are obviously a departure from the current Amiga titles catalog. That's the point. If you are going to attract a new group of consumers to a product you are going to have to tailor your product to be interesting and worthwhile to them. ❏

Computer Graphics, 2nd. edition, McGraw-Hill, (c) 1979, 1973

[7] Rollo, C., "Pie Menus for Windows 3", Dr. Dobb's Journal, November, 1992

[8] Wiseman, N. E., H. U. Lemke, and J. O. Hiles, "PIXIE: A New Approach to Graphical Man-Machine Communications", Proc 1969 CAD Conf. Southhampton, IEE Conf. Pub. 51, p.463

The Success of DICE

Mathew Dillon

As many people know, I've generated rather copious amounts of code for the Amiga. While many of these programs could have gone the shareware route, I wound up doing only one that way... DICE. DICE started out as a normal 'yet another freeware program by Matt Dillon' but moved quickly to take on a major percentage of my time (In other words, I was enjoying myself). It got to the point where I really had to start charging for it to justify the time I was spending working on it and that was when I split the freeware version off from the registered version.

Basically I came up with a price and update scheme that would be manageable for one person to handle by his lonesome. The freeware release would offer a freely distributable and very usable version of the compiler and serve not only to give the many people out there a real compiler to do real programming with, but also serve as an advertising medium for the registered release. There would be no support associated with the freeware release.

The registered release would be purchasable for a modest sum, an amount that I would feel comfortable with charging for the time I was spending on continuing work and overhead, but also an amount that reflected the lack of phone support (remember: single person operation here) and my overall purpose, that of getting a really hot C compiler to everyone out there who would not be able to otherwise afford one. Since I was not trying to make money, $40 seemed a reasonable amount. After a couple months it became obvious that that wasn't quite enough so I upped it to $50, which is where it stands now.

Two things went into the original thinking of the registered release to keep as many options as possible open. For one, postage for two distributions and 6 disks is included, consisting of the initial distribution (3 disks) and one free update (another 3 disks). Originally I figured I could send postcards to people when an update became available but my mailing list grew so quickly and I made so many minor updates to the distribution that this became impossible.

I had to change the policy to 'you get your free update when you request it'. Since many people are comfortable waiting a while to update (some people do not update at all), this policy is the most efficient and least burdensome. I think that providing the 'free update' is a major boon to any shareware software and not in the least burdensome if (a) you take it into account with your pricing and (b) you require that people request the update instead of sending out postcards when one is available. For a single person operation, that is.

Developers Roundtable

It seems the idea of a roundtable has struck a nerve, especially now that the Amiga Developers Association is no more. One of the things that was obvious from talking to people at DevCon is that some level of insulation between developes helps. A kind of circuit breaker if you will, to prevent the lines from overheating. The point of this roundtable is to make forward progress for everyone, not to provide another forum for endless arguing.

First item for discussion Hot-Links. More than 100 copies of Hot-Links documentation have been distributed. If even a fraction of those implement it, Hot-Links looks like it will become a de-facto standard.

Now for the bad news. Two gripes came up repeatedly about Hot-Links from other developers. First, no one liked the way it was sprung by surprise without advance warning or comment. Second, enough commercial developers complained about having to send software to Soft-Logik to be certified Hot-Links "compliant" that we have a problem here. For its part Soft-Logik has the not unreasonable position that if it is going to be advertised as Hot-Links compatible than they want that confirmed.

It turns out that the tests are pretty simple and straightforward. They just try the Hot-Links features with other known working Hot-Links programs. If the features works than it passes, if not it fails. The problem for other developers of course is that they are not thrilled about sending there latest and greatest unreleased software to a possible competitor. Since this type of problem will arise with other things than Hot-Links, the solution is a neutral ground. I volunteer Argonauts services to test software in cases like this and to maintain confidentiality. Argonauts does not sell software and so does not compete with any of you, neither is it in my interest to violate your trust.

A solution to the unhappiness at being surprised is even easier. If the intent is to make something generally available at no cost than a good approach is to copy the internet idea of the RFC or Request For Comment. I'll publish them here and permit the RFC only to be freely copied. While everyone would be free to comment the issuer would be the final arbitrary of the document. What will keep them honest? Rational, coherent, reasoned technical arguments and the marketplace. If too many people swear they'll

The second thing I did was make absolutely clear that the fee for obtaining the registered version of DICE would be fully applicable to a future commercial upgrade if it were to occur. Now that I am going commercial with DICE, this has proved to be invaluable because people feel they can still purchase the registered version of DICE without worrying about 'wasting money' on a commercial version which is about to come out. The registered users will get a special upgrade offer that takes into account the $50 they've already spent.

The Value of ShareWare

All to often people try to make a living from programs they write and make 'shareware'. This has often proved to backfire for several reasons:

- (1) If you distribute a totally crippled version of your program then not only will nobody use it or spread it around, nobody will purchase the 'complete' version either.

  You have to provide basic functionality and the program must be usable for small things. In other words, don't disable the SAVE function but DO limit the project size. for example, take a spread sheet... Leave everything enabled but limit the spread sheet size in the posted version to, say 16x16.

  The result is that people will be able to use the posted version for real life work, grow to like it, and purchase the unlimited version when they hits the limitations. The program will also get spread around much faster.

- (2) Don't expect to make money from simple stupid programs. If it takes you less then a week to write a program then it probably isn't of shareware calibre. No one is going to purchase a program which they feel is to simplistic.

- (3) Don't expect to make money from utility programs. Most people have DOZENS of utility programs, they might really like yours but if they only use it once a week anyway they are not likely to purchase it.

The key, really, is to write an application that is substantially useful and substantially used. I never thought a C compiler would result in so many people (and no, I'm not going to say how many people have registered for DICE), but it has, and if a specialized niche product like a compiler can do so well then end-user products have the potential for doing even better!

Problems Associated with Success

Mail for one... both mundane and electronic. While I answer every letter I get, I generally have to deal with mail in batch mode these days (i.e. wait two weeks, spend a day answering everything that's accumulated, and repeat). With no secretary in sight, I'm sure I have pissed off more then a few people who wait a month for a reply to a question and then don't get a substantial response. In many cases, I am simply not given enough information to formulate a good answer!

implement the thing over their dead bodies than it won't get very far as a standard.

Here's a first RFC to get the ball rolling.

RFC-1993-1-Argo

Problem: The Amiga needs an ORB, Object Request Broker.

This need not be compliant with the CORBA being developed in the workstation world, though there should be at least the hope that the two could communicate. The great attraction of any proprietary system like the Mac or Amiga is that it can be smaller, faster, cheaper and maybe better than the standard.

The ORB would operate at a fairly high level, probably two steps removed from something like the Datatypes library. Conceptually it should be able to hide the underlying nature of the service providers. Some examples.

My program or I know nothing about whether it is a local device or a network device nor should either one care.

This should be true in general for user oriented services. As the paradigm shifts from program centric to data centric we need an ORB. Ideally the first specification will be almost moronically simple so that it can be quickly put out for use and comment. Making the first cut very simple and highly abstracting the work it does makes it much simpler to make it complicated later without breaking the earlier work.

One possibility would be to use the Exemplar spec being pushed by Apple, IBM and Novell. This is a cross platform technology intended to be usable on UNIX, OS/2, PowerOpen, Netware, Windows and Macintosh. In short, we could do worse than throw in with this group.

Next topic. The idea of some kind of uniform front package art has also drawn comment. The visual impact at the retail level is a definite plus. Some good practical suggestions were made. CDTV titles already have a color scheme for different product classes and the same colors should be used here(you can get them from CATS). A second suggestion was that the product name be printed in large type on the sides of the box to make it easier to id the product when stacked sideways, as is often the case for inventoried stock. A last change comes from Commodore. While I am

Older projects... to put it simply, I reached overload about a year ago and had to start telling people that I was no longer working on certain projects. DNet is a good example... 5 years old and still going strong, but I have no time to work on it. DME is another example but in a slightly different light. DME is still an active project, but have several DOZEN disks of enhancements that people have sent me that I couldn't possibly find the time to put in! There is some point where one must retire a project to make way for the ever growing list of new projects.

Fortunately I have only one shareware product, DICE, and that gets priority and that's the last topic I would like to talk about.

Support

You do not have to offer phone support, but your pricing should take that into account. You should be absolutely clear as to how you will support the product (update policy) and how long you intend to support the product (one time, a year or two, or until hell freezes over). Keep your options open so as not to close down your own market when you make a price change or go to a higher level of support / commercial, or whatever.

The most important thing is to set your initial pricing with an eye towards success. I made the mistake of pricing DICE too low, it was originally $40. Even though I upped it to $50 within 6 months, it took more then a year AFTER THAT before the majority of registrations I received reflected the price change.

Take into account not only the possibility of high volume, but also the possibility of low volume. I've heard horror stories of authors who wind up spending a huge amount of time supporting relatively few users, and loosing money. The 'trickle registration' problem is generally associated with having an unsupportable update policy. For DICE, the first update is free (it has to be requested), and updates beyond that are currently $10.

I made that $10 price with an eye towards being able to continue to support DICE after I level out (which hasn't occurred yet). The fact that updates beyond the first free one costs any money at all allows you to raise that price in the future by small increments without alienating your user base (to account for inflation or a change in the breakdown of new registrations vs. updates).

Basically, you need to find a pricing policy with which you can remain comfortable for 10 years or more. As I have said, I've heard horror stories. What do you do when you can't support a shareware product anymore yet still get checks in the mail? Or worse, cash?

The poor person that gets into this situation will wind up either simply tearing up the checks or returning them with a 'sorry' note, and their reputation will be degraded by that, and cash... well, cash is even worse because to be honest you really have to return it if you decide not to support a product any more. I hope that that situation will never happen to me, I believe that my policies regarding DICE will allow me to continue to support it as long as the Amiga exists!

» *Publisher's Note* «

waiting for an official reply it seems that it is unlikely that we would be able to spell out AMIGA.

The short explanation is that this widespread use of the word could lead to generic use which in turn could weaken the trademark status. If the official reply is along these lines than we could still use the same idea but substitute AM or to be mischievous A. The A is tempting but I think it would confuse many consumers who would assume it was A for Apple.

This package idea is simple but effective and as I said last time incurs no extra expense. Willingness to do this kind of thing is a reasonable measure of how well companies can cooperate to increase the overall market size.

Next topic Dylan. Dylan is the new dynamic programming language designed by Apple. They are keen to see this move beyond the Mac world and are interested in talking to people who want to bring it to other machines. Last issue I gave out the address for requesting a free copy of the Dylan manual. This issue I've been given permission to give out the contact at Apple to talk to if you are seriously interested in Dylan. The person you want to talk to is:

Andrew LM Shalit alms@cambridge.apple.com or call him at 617 374-5353. At least one Amiga company is already talking about what is involved in porting Dylan. If you think you have the talent to handle this kind of port write to me at the Argonauts address and I will put you in touch with them.

Next topic. Demo CD-ROMS. This is another case where there is tension between the people providing the demos and the people who profit by selling these demos. Put simply it irks the people who are giving this stuff away that someone else is going to make money off of it. Since I've already been contacted by people interested in producing such a CD here is how I see things.

Getting a regularly scheduled sampler CD out every say 6 months is in many people's interests. The retailers can use it to generate in store traffic as people drop by to see and download the latest and greatest. Developers need it because it would be an invaluable source of advertising. This is especially true as Commodore continues to try and place the low end Amigas into wider distribution. Large chain stores won't carry dozens of different titles but they would carry one sam-

While Matt won't say just how many registered DICE users are out there, it is safe to say that DICE must be one of the most successful shareware programs on any platform. What separates it from the commercial C compilers? Support, documentation and packaging.

One other thing I would add about collecting money via shareware. Get a mail forwarding service. These are companies that you rent a PO Box from and then they forward your mail to whereever you happen to live. My own experience in tracking down author's and doing promotional mailings is that people move like crazy. If there is a stable mailing address for people to register their copy at, you stand a much better chance of collecting whatever money people do send you.

CDTV IN EUROPE

Janet Bickerstaff

Greetings from England. First the introductions. My husband and I are certified Commodore developers and attended the Developers Conference in Orlando in January. We are freelance writers, working mainly for Amiga User International, and I have been covering the CDTV scene for two years, so you will see I am the right person to bring you the latest news from this side of the pond.

Some of you may have heard Jim Mackonochie, General Manager CDTV Europe, at the DevCon when he said 'Europe is Amiga world. The Amiga dominates Europe. There is money to be made on the Amiga and CDTV. CD ROM is the future and will be integrated across the Amiga product line. The key areas for CDTV sales are the UK, Germany, Italy and France. 50,000 CDTV units were installed in Europe by January 1993. Worldwide figures are not available.'

For professional users there are third party upgrades for the CDTV such as a SCSI interface card, and the Blizzard board with 8MB of fast RAM, enabling the use of the latest Scala MM program. Details from Chartscreen (UK) Ltd. Tel: +44 (0)425 475515 Fax: +44 (0)425 475525.

On 23rd March the Amiga press were invited to CBM offices at Maidenhead for 'a major news announcement', which transpired to be the UK launch of the Amiga 4000 with the 68EC030 chip. The UK retail price for this machine is £999 including value added tax of 17.5%. Some present were hoping to hear news of an upgraded CDTV, but I understand that this will not be in the near future (unless CBM spring a surprise on us!) Development work is in progress on CD ROM drives across the Amiga range.

In the UK we hold our own DevCons, which for the last two years have been held at Buxton. From a meeting held at the 1991 DevCon has grown "The Buxton Group", now formally called the European Multimedia Research Group. It forms a basis for collective action on behalf of the CDTV developer community as well as disseminating information to interested parties. Regular meetings are held and the latest products are demonstrated. From April 1 the developers will pay an initial fee of £10 a year to become members. For details of the Group contact Paul Ralph at Almathera Systems. Tel: +44 (0)81 683 6418.

pler CD-ROM.

I'd honestly like to see this hit the streets with a retail price no higher than an expensive music CD, say $20.00. Two things that can be done to help achieve this are prepaid subscriptions and multiple sources. This is something that needs more discussion and I invite you to write or e-mail me with your positions and thoughts on this. This topic is of immediate concern to many people and I think we should move as quickly as possible. I particularly want to hear from the dealers who would be the initial backbone for any project like this.

Next topic. Networking, the people kind, not computers. Last year we watched a search firm advertise and announce in every medium available for an Amiga programmer with Satellite communications background. Companies needing to hire Amiga technical people don't need this kind of aggravation and are put off by it. At the same time Amiga talent wouldn't mind having a central place to hawk their skills. After talking with different people it seems there is a demand for a registry of available talent. The list will be published at least once a year in Argonauts .

We are also working with Commodore to publish a map of the US showing the geographic distribution of all registered developers. This will not disclose names or addresses. The map if it is approved will be based on zip codes only. The idea is to help build a sense of community and give you an idea of where you all are.

Next Topic The tools issue. Listen up, it seems that the last issue did not make its way to the marketing types in your companies. So far only one company has responded. Quma Software, who incidently, had something interesting . Here is the situation. The Amiga market is changing. More and more companies who know or care not about the traditional Amiga milieu are trooping to Commodore's door. They are looking at the system as embedded controllers or inexpensive(to them) delivery platforms.

If you're a project leader at some place like NASA or a fortune 1000, being told to go down to your local Amiga dealer and pick a a copy of Amazing Computer's product guide really doesn't cut it. You expect to get a reasonable amount of material from the machine's builder. The idea with the tools issue is that extra copies will be printed and

Fax: +44 (0)81 689 8927. Email: jralph@cix.compulink.co.uk.

Already all CDTV developers have the use of a Philips CDD 521 disc cutter, and for members the cost of cutting a gold disc is only £50 for the first disc and £27 for additional discs. This is a great saving over the cost of using commercial pre-mastering services.

The UK CDTV developers have a closed area on CIX (similar to BIX) where problems can be discussed and opinions aired. Engineers from West Chester come on-line to receive bug reports and give advice.

Details of the 1993 European Multimedia Awards contest (EMMA) have been announced. Entries must be submitted by July 31st and will compete for a total of 14 industry-sponsored awards. A new feature of the EMMA competition is the addition of a 'Best Non-European Product' category. Entry forms are available from European Multimedia Awards. Tel: +44 (0)61 429 9448. Fax: +44 (0)61 429 9568. Last year Virgin Games' CDTV title Musicolor won an EMMA as the Best Educational Application. ❏

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The Amiga Marketplace

Dan Weiss Soft-Logik

I f you are reading this article, and are a subscriber to Argonauts, the odds are that you are involved with the development, publishing or reselling of products for the Amiga marketplace. For some, this means that you work for a company that has a successful line of products that are sold worldwide. For most however, your marketplace or product line is more limited. Surprisingly, many of the so called big names in the Amiga industry do not fit in the first category, and are in fact smaller than you think. Small can be good though, depending on what you hope to accomplish in this market.

This article opens a new series that will look at the business side of what it means to be in the Amiga business. At first we will look at the software development side of things and then expand into the opportunities for hardware and value added resellers.

Selling Software

On the Software side of the Amiga marketplace, there are many areas of opportunity at as many levels of quality and quantity of product. A simplistic way to break things down is by how the software is developed. *Programmer, Developer, Publisher, Combination* are the macro categories that can be used to describe the software business. Programmers are usually lone operators that are programming mainly for there own benefit. Developers may be a one man operation or a small company. They develop software that is then published by an established publisher or combination company. A publisher does not

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create products of it's own, but instead packages and markets products from other developers and programmers. Finally a combination software house both publishes and develops software. With the trend towards more smaller products, many of the big name software houses have become combination houses.

Now, in depth, lets look at what theses classifications entail. The programmer is the lone wolf, or at most a small pack. Statistically, this constitutes the majority of Amiga developers, and the backbone of the shareware marketplace. Programmers often do not have a software company per se, but instead release their software under their own name or an unregistered company. Operating costs are very low. Since the programmer is usually alone and has other employment, there is very little if anything the company is financially responsible for.

The programmer usually owns an Amiga before starting to develop software, and has also already incurred and absorbed the costs of necessary development tools and materials such as programming languages, hard drives and additional memory. If the programmer is particularly active they will belong to at least one on-line service, hopefully BIX, so that they can keep up to date on system software and release their products. This could in fact be the largest single charge incurred as a programmer. Packaging costs are negligible. Most of the time the user will download the file and keep it. If they do in fact pay the fee, the developer can use the payment to cover the cost of the materials sent to the user. Depending on the quality and depth of the documentation, what is sent to the user may represent a significant cost. In all cases, the biggest fees will be diskettes and postage. A good idea is to used standard, not oversize envelopes and only send one disk. This keeps postage and materials costs down.

The big advantage to being a programmer level developer in the Amiga marketplace, is that it is cheap and can be very rewarding. I should clarify that I mean emotionally and spiritually rewarding. Generally, shareware is not financially rewarding. Oh sure, there are stories of people pulling in $30,000 a year in shareware fees, but that is just not going to happen in this marketplace. On the positive side, to pull in a couple of thousand on $25 shareware product is not unrealistic. What this does means is that you better not give up your day job if you need it for the paycheck. What shareware can do is allow you to build a stake to increase you equipment and software resources so that you can move up in the development chain.

It is also important to consider this; while as a whole they are not wildly successful, often a fairy godmother can come along in the form of a publisher and propel their product to stardom. Directory Opus and Art Expression are two examples of this happening(CrossPC, written by a New Zealand college student is another, the Publisher). I'm sure that there are many more cases though of products being ignored (justly or unjustly) or dropped after being readied for the big leagues. Which leads to the pros and cons of being an Amiga *programmer* level developer.

Pros: It's cheap and easy to start, it's on a computer you know well and are very interested in. Since there is less software, there are still lots of neat things to develop, the Amiga is not dead, you can work on

NewsLine

Pinnacle Micro has introduced the RCD-202 recordable CD-ROM drive. This can be used to make your own CD-ROM. The drive is priced at $3,995. Pinnacle can be reached at 714 727-3300. Business America, a database of over 10 million Businesses on one CD-ROM is available, contact them at 402 593-4565. Requires IBM PC and a CD-ROM drive.

Motorola finally getting aggressive, pricing 50Mhz 601 PowerPC chips at $280 in quantity. Availability 3QT 93. HP to introduce the PA7100LC RISC processor in 1994. The 7100LC is a low cost version of the 7100 used in their current workstation line. It will be aimed at the multimedia market incorporating parts of MPEG and JPEG algorithms in the instruction set. The chip will reportedly run video at 30 frames per second without extra hardware.

Taligent, the Apple/IBM object oriented operating system company is up to 250 employees. Taligent's OOP OS code named Pink is expected in 1994. According to Rick Berzle, VP for marketing, "We want to get back to the point where three developers can go into the garage and develope something interesting and get it out to market."

News from a Software Publisher's Association report excerpted in the March 16 issue of Information Week p66. The survey based on a random survey of 672 households. Greatest influences on software purchases for home PC users: recommendations from friends and associates(word of mouth) first, price second. respondents admitted that 40% of their entertainment software had been surreptitiously copied.

Pricing discipline collapses. At an SPA conference in San Diego during March panel members predicted prices falling under $100 permanently for all applications. Stephen Dukker, President of CompUSA predicted, "consumer software selling for $10 to $20 and business software for $50 to $100.

Serif Inc (800) 697-3743 is introducing PagePlus 2.0, a Windows desktop publishing package for $59.95. "It gives you 90 percent of the features in PageMaker and it's a little easier to pick up," said Joe Rotello president of Windows in Knoxville.

IBM has published a white paper describing their multimedia thinking. It is titled "Multimedia Distributed Computing." A copy can be obtained at no charge by calling 800 426 9402.

Apple has release a QuickTime Movie Exchange Toolkit. The toolkit includes source code in C and C++. The kit includes applications for DEC VAX, IBM RS6000, SGI, Sun-4(SPARC), Cray YMP and Windows. The kit is useful to consultants and VARs needing to move data created on one platform to another. Contact APDA at 800 282-2732.

News items culled from various sources including Info and PCWeek.

whatever you like, you may make it to the big leagues with a publisher.

Cons: It doesn't pay the bills (usually), while you may like your product nobody else may, complex projects take more time and resources than you have, maintaining the product and supporting the customer is a lot of work.

Generally this is not the level of the serious people in the Amiga marketplace. It can be great fun, but it's not really a business. While the marketplace needs people like this, they are rarely the ones that push the market forward, or have to worry about running a business. Remember, the Toaster and it's software are not shareware.

Next issue we look at the *developer* level and what they offer and need. ❑

Research Corner

SUPERTROOP VIA I-PORT: DISTRIBUTED SIMULATION TECHNOLOGY FOR COMBAT DEVELOPMENT AND TRAINING DEVELOPEMNT by Paul F. Gorman August 1990

Prepared for DARPA.

Obtain through interlibrary loan. Try Navel Academy in Annapolis.

Why would you want to read this? If you're a science fiction fan you may remember powered armor. This paper discusses directions being explored to make this a reality. The discussion is in the context of a project called *Simnet*. Simnet was designed for creating combat simulations for training Army personnel in armored warfare.

One result of the Simnet project was a Distributed Interactive Simulation(DIS) protocol. The whole system inlcuding DIS is set up to allow hundreds of players to roam virtual worlds up to 100,000 square kilometers. The entire project is estimated to cost between $400million and $1 billion when complete. To keep costs down the simulators have imagery comparable to good arcade games.

Why should you care about this. Because the DIS protocol can be implemented by anyone. Why reinvent the wheel if the government has already done the R&D to develope a protocol sophisticated enough to support a functioning multiplayer networked virtual world.

You have two business opportunities here at least. One get ambitious and use the governments small business programs to go after a piece of the DOD project itself. Two, learn the protocol well enough by implementing it on the Amiga that you are employable by one of the companies that do win contracts on this job.

Three and perhaps most intersting use the protocol to create franchise opportunities. If networked A1200's could handle the task, the capital requirements are not unreasonable for people to set up large team simulations. You could provide a steady revenue stream by periodically comming out with new worlds and variations on different themes.

Finally there is the educational benefit. Who says you have to simulate wars. How about ecologies? People get to be predetors or prey.

Argonauts Amiga Registry

(This form may be duplicated)

The purpose of the Registry is to help commercially active Amiga people connect with each other. The first registry will appear in September 93

A registry listing is a benefit offered to Argonauts subscribers. Limit one listing per subscription. If you are not a current subscriber, don't forget to include a check for $24.95 payable to "Morning Star International" U.S. funds drawn on a U.S. bank only.

First Name	Last Name
Company	
Street Address	
City	State/Province	Zip/Postal Code
Tel number, include all prefix codes	Country

CHECK ALL THAT APPLY

I am a ☐ certified developer ☐ commercial developer ☐ unregistered developer

☐ Publisher looking for products to market

☐ systems programmer ☐ application programmer

☐ 2D ☐ 3D artist

☐ animator ☐ technical writer

My specialty is: Check all that apply

☐ Entertainment ☐ Network ☐ Productivity
☐ Kiosks ☐ CD-ROMS ☐ Utilities

I have been involved in producing a commercial Amiga product _____

Product name

Dealers Only!

Why should you waste a perfectly good stamp to say nothing of at least 15 or 20 minutes filling this survey out? Because you are the only link in the chain who doesn't have enough information to tell what's going on in this market and decide where to put your hard earned money, like maybe into a burger franchise instead of computers. You think Commodore doesn't know how many Amigas they sell each year? Or that any of the Amiga third party vendors don't know how much product they are pushing out the door? Sure, the distributors can tell you the top 50 selling products. That, and a token will get you on the subway as we say in New York. There's money to be made in this market and new directions to go in but you need hard numbers to make those tough calls. In other industries these kinds of reports sell for thousands of dollars. For the effort of filling this form out and taking a $24.95 subscription you can get the same stuff the big boys have. But to make it work, almost all of you are going to have to participate. It's your call. Collecting and processing this information is an expensive, time consuming task and if the response rate is not in the hundreds of forms it will be a waste of time because the numbers won't be meaningful.

REPORT NUMBERS FOR THE JAN FEB MARCH QUARTER ONLY

	Quantity
Amiga 1200 sold(all)	_____
Amiga 4000 sold(all)	_____
Top 5 games	
1_____	_____
2_____	_____
3_____	_____
4_____	_____
5_____	_____

	Quantity
Video boards sold(all)	_____
Memory/Accel sold(all)	_____
Top 5 non games	
1_____	_____
2_____	_____
3_____	_____
4_____	_____
5_____	_____

Mail the completed form back to the address below. Don't forget to include your own address so I know who the forms are coming from. Only forms from resellers; dealers, mail order houses, VARS etc. will be counted.

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